Fig. 1

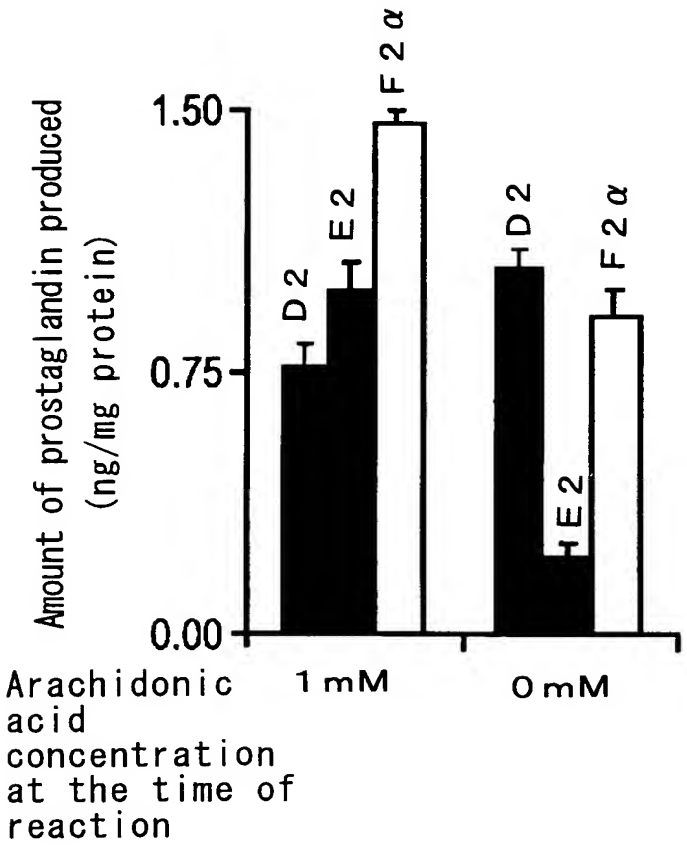
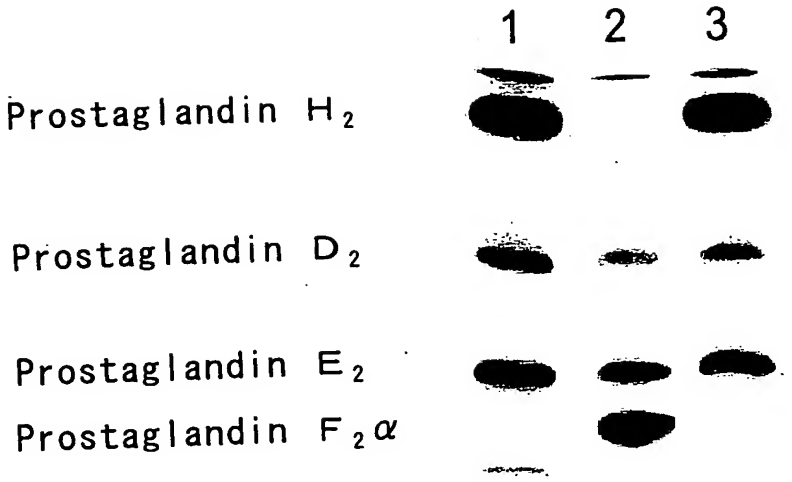
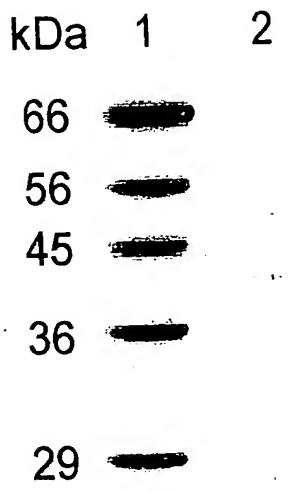

Amount of prostaglandin produced (ng/mg protein)
1.50
0.75
0.00
D2
E2
F2α
D2
E2
F2α
1mM
0mM
Arachidonic acid concentration at the time of reaction

Fig. 2



1. No enzyme
2. Trypanosoma cruzi extract
3. Trypanosoma cruzi extract after heat treatment

Fig. 3



1. Molecular-weight marker protein
2. Purified enzyme

Purification step	Total protein (mg)	Enzymatic activity (nmol/min)	Specific activity (nmol/min/mg protein)	Purification ratio
Soluble fraction	171.0	154	0.9	1.0
20-80% saturation ammonium sulfate fraction	127.0	150	1.2	1.3
Superdex 200	113.0	150	1.2	1.3
Ultrafiltration chromatogram Hydrophobic chromatogram	8.0	170	25.0	28.0
DEAE ion exchange chromatogram	2.8	180	64.0	71.0
Superdex 200 Ultrafiltration chromatogram 2nd time	0.3	210	700.0	778.0

Fig. 4

Fig. 5

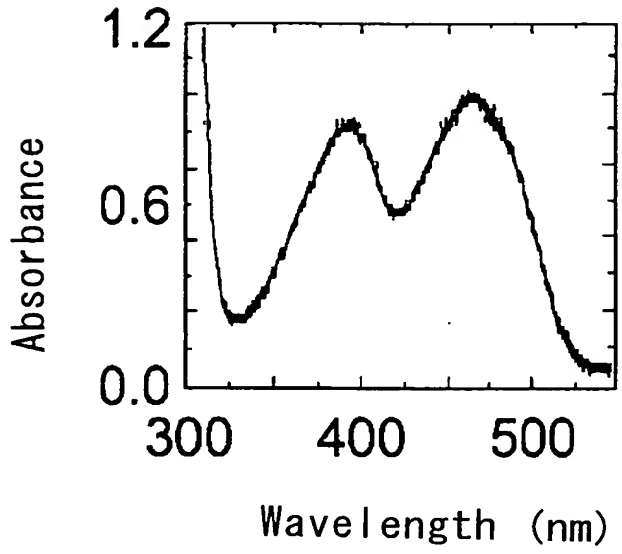
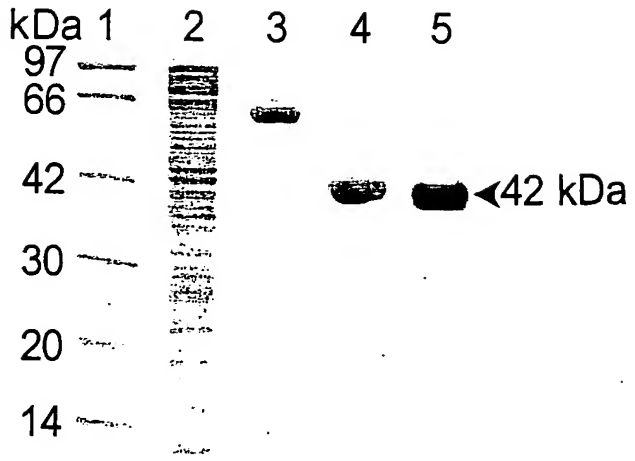


Fig. 6



1. Molecular weight marker protein
2. E. coli crude extract after transformation
3. Crude extract of E. coli expressing the recombinant TcOYE
4. Recombinant TcOYE collected by thrombin treatment
5. Purified standard of the recombinant TcOYE

Fig. 7

Substrate specificity of reduction by the recombinant TcOYE

Substrate	Cofactor (10 μM)	Km (μM)	Vmax/specific activity (nmol/min/mg)
9,11-endoperoxide PGH_2	NADH	—	554
	NADPH	5.0	766
Hydrogen peroxide	NADPH	2.3	99
BHP[a]	NADPH	n.d.	282
Menadione	NADH	—	499
	NADPH	0.82	700
β-lapachone	NADH	0.17	650
	NADPH	—	433
4-nitroquinolin-N-oxide	NADH	—	759
	NADPH	9.5	1110
Nifurtimox	NADH	—	290
	NADPH	19.0	353
Phenazine methosulfate[b]	NADPH	10.4	235
Mevinolin[c]	NADH	n.d.	555
12-oxo-phytodienoic acid[d]	NADPH	n.d.	152
9-oxo ODE[e]	NADPH	n.d.	54
Econazole[f]	NADH	n.d.	43
Benznidazole	—	n.d.	N.D.
Miconazole[g]	—	n.d.	N.D.
Ketoconazole[h]	—	n.d.	N.D.
Crystal violet[i]	—	n.d.	N.D.
BHT[j]	—	n.d.	N.D.
BHA[k]	—	n.d.	N.D.

a: t-butyl hydroperoxide, b: 5-methyl-phenaziummethylsulfate), c: 2-β, 6α-dimethyl-8α-(2-methyl-1-oxo-butoxy)-mevinic acid lactone), d: 4-oxo-5β-(2Z-pentenyl)-2-cyclopentene-1β-octanoic acid), e: 9-oxo-10E, 12Z-octadecadienoic acid, f: 1-[2-([4-chlorophenyl] methoxy)-2-(2,4-dichlorophenyl)ethyl-1H-imidazole], g: 1-[2,4-dichloro β-([2,4-dichlorobenzyl]-oxo)phenethyl] imidazole, h: cis-1-acetyl-4[4-[2-(2,4-dichlorophenyl)-2-(1H-imidazol-1-yl-methyl)-1,3-dioxolane-4-yl-methoxy]phenylpiperazine], i: N-[4-[bis[4-(dimethylamino)-phenyl]methylene]-2,5-cyclohexadiene-1-yl-iden-N-methyl-methane aluminum chloride, j: (2,6di-tert-butyl-para-crezol), k: [2(3)-tert butyl-4-hydroxyanisole

N.D.: not detected

n.d.: not measured

Fig. 8

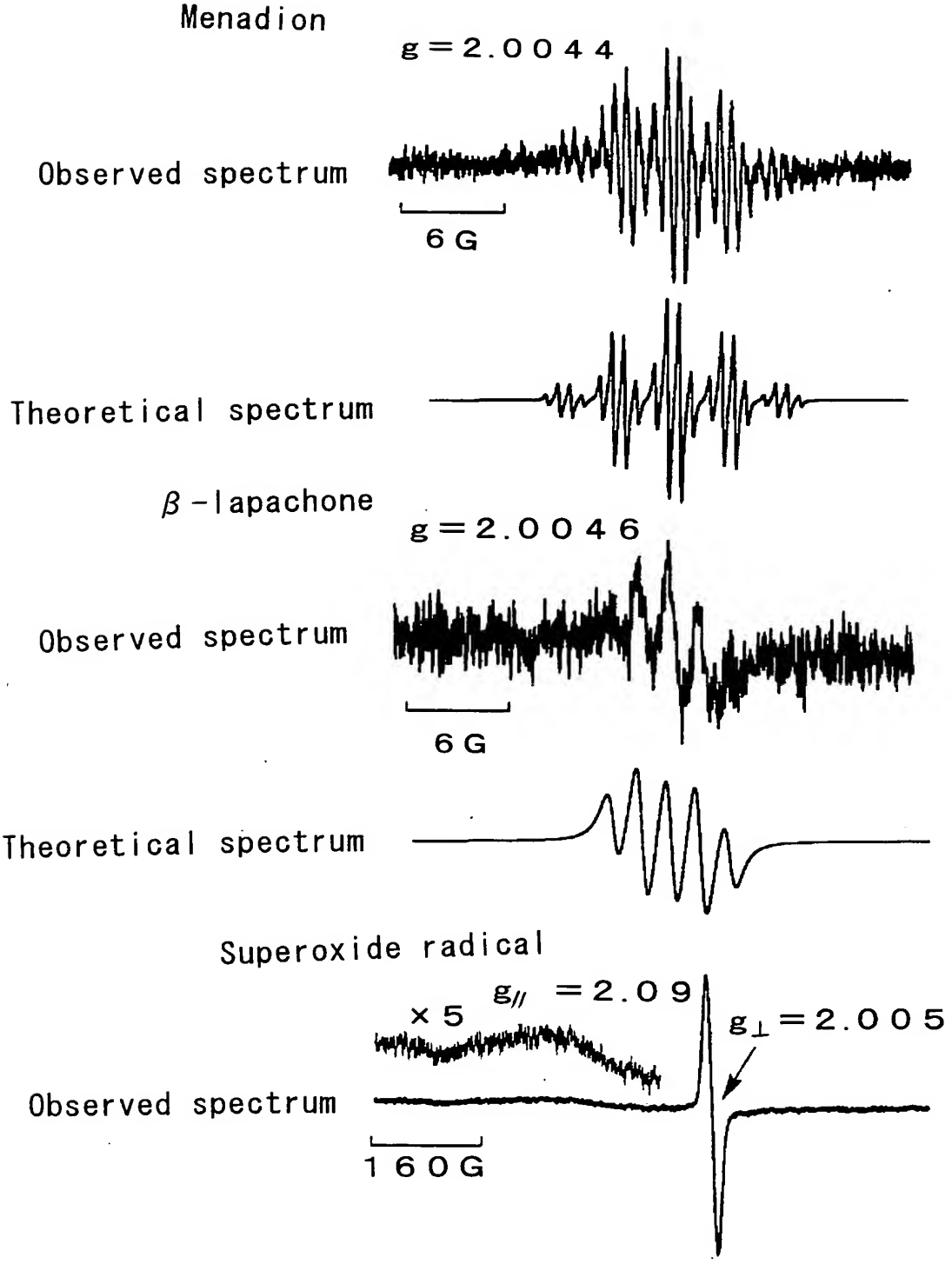

Menadion
g=2.0044
Observed spectrum
6G
Theoretical spectrum
β-lapachone
g=2.0046
Observed spectrum
6G
Theoretical spectrum
Superoxide radical
g// =2.09
×5
g⊥=2.005
Observed spectrum
160G

Fig. 9

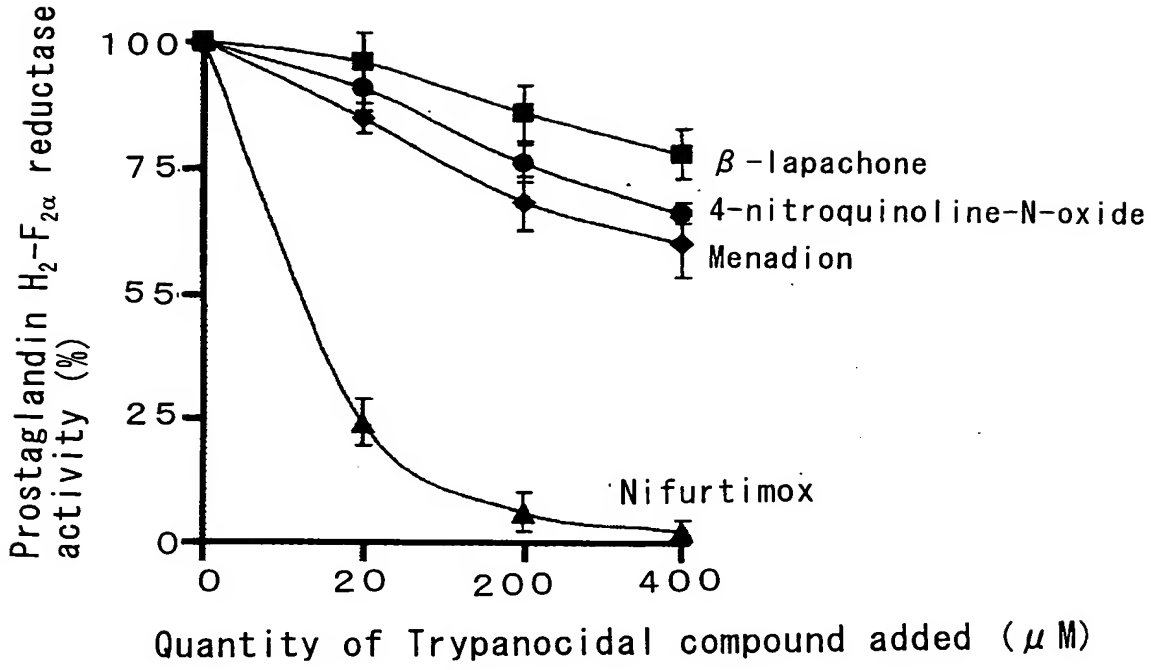
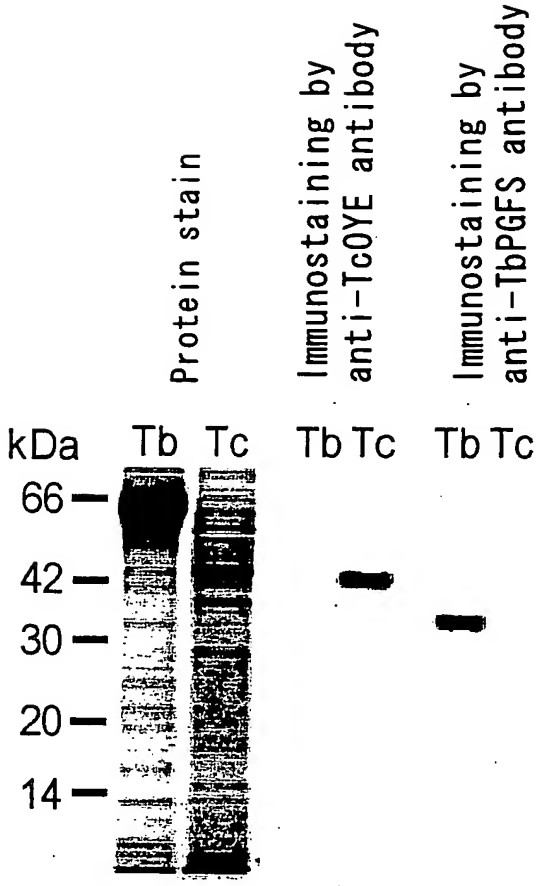
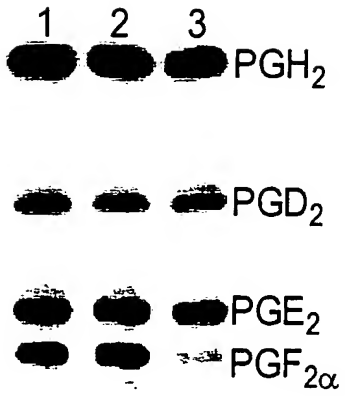

Prostaglandin H_2-$F_{2\alpha}$ reductase activity (%)
100
75
55
25
0
0
20
200
400
β-lapachone
4-nitroquinoline-N-oxide
Menadion
Nifurtimox
Quantity of Trypanocidal compound added (μM)

Fig. 10



Tb: Crude extract of Trypanosoma brucei
Tc: Crude extract of Trypanosoma cruzi

Fig. 11



1. Trypanosoma cruzi crude extract after reaction with control IgG
2. Trypanosoma cruzi crude extract after reaction with anti-TbPGFS antibody
3. Trypanosoma cruzi crude extract after reaction with anti-TcOYE antibody

Immunoprecipitation by the anti-TcOYE antibody of the enzymatic activity to reduce menadion, β-lapachone, nifurtimox, 4-nitroquinoline-N-oxide in the crude extract of Trypanosoma cruzi

Sample	Persistent enzymatic activity (%) Menadion	β-lapachone	Nifurtimox	4-nitroquinolone-N-oxide
Trypanosoma cruzi extract after reaction with anti-TcOYE antibody	[a]N. D.	10(±2)	N. D.	N. D.
Trypanosoma cruzi extract after reaction with anti-TbPGFS antibody	98(±8)	103(±3)	100(±5)	100(±10)
Trypanosoma cruzi extract after reaction with control bovine IgG	100(±4)	100(±6)	100(±10)	100(±6)

Fig. 12